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Islanders. On the contrary, I should be inclined to look among the Papuan races of New Guinea or New Holland for the nearest allies of the men to whom the shell-mound once belonged.

I am, my dear sir, faithfully yours,

F. W. HUXLEY.

Dr. Hunt, Secretary of the Ethnological Society.

XXV.—*On some Human Remains from Muskharn, in the Valley of the Trent, and from Heathery Burn Cave, near Stanhope, in Weardale, Durham.* By S. J. MACKIE, F.G.S., F.E.S.

THE remarkable discovery of flint implements in geological strata of Drift origin has infused great energy into the research for knowledge of the primitive races of man; and, although as yet no osseous remains have been found associated with the fossil flint implements, other instructive human relics, of later, but still very ancient periods, have been met with, sometimes in caves, sometimes in tumuli, and sometimes in the alluvial deposits of rivers. This, too, in other countries as well as in our own. Such relics must be very common; but, important as they are to science, they are but rarely preserved, and even the collections made by professedly men of science have been remarkably incomplete.

In some cases, such as those of Neanderthal or Natchez, the stratigraphical details have not been properly recorded; in other cases, such as that of Engis, they have been ignored, or, as in that of Aurignac, have been altogether suppressed. In some cases the works of art have been collected by antiquaries, and the human bones thrown aside; while, on the other hand, the bones have been sometimes preserved, and the works of art dispersed. Even now there is no effort made in our museums to keep together the articles of various finds in the manner in which they were associated; but the articles are divided and separated into classes, and one has to go to a dozen trays or cabinets to pick out unsatisfactorily the objects which, if kept together, would have been as it were an intelligible fragment of a scene of early domestic life or of ancient history. Isolated and fragmentary, in an ethnological point of view, as is still the evidence of the more ancient races of man, yet this evidence is sufficient to show that distinguishing type-characters separated them into distinct groups at a time far anterior to the historic period of our country.

The accompanying table, in which are roughly and temporarily

arranged the most noted instances of early human remains, we have examples of no less than five types—and, indeed, six, if the Neanderthal be a natural and not an idiotic example. This table

Periods.	BRACHYCEPHALIC.		DOLICHOCEPHALIC.			
	Supraciliaries small.	Supraciliaries large.	Forehead moderately developed.	Forehead retrocedent.		
			Supraciliaries small.	Supraciliaries small.	Supraciliaries large.	Supraciliary ridges very large, continuous over nasal suture.
Iron.						
Bronze.	..	..	..	Heathery Burn, A. Plymouth.	Heathery Burn, B.	
Prehistoric, <i>i.e.</i> of which accurate information does not exist.	Etruria Kellet.	..	Newslade.			
Monumental.	..	..	..	..	..	
Earliest tombs.	..	..	..	..	Nether-Urquhart.	
River alluvium.	..	..	..	Blackwater Borris (bed of Nore).	Muskham.	
Peat.	..	..	..	..	Sennen.	
Ground stone implements.	..	Plau Montrose "Borreby"	Eastham, Leicester.			
Gravel, cave, and "chipped stone".	..	..	..	Engis.		
Doubtful.	..	..	..	..	..	Neanderthal.

is intended to give an outline view of what is known of the eras and ranges in time of those races. Imperfect as it must necessarily be, and requiring great additions and very many modifications hereafter, it may still serve to show at a glance the extent of our present meagre knowledge. In it, however, will be seen a column headed "Trent type", and so named with reference to a skull which I have placed on the table, and to which I wish to draw the especial attention of ethnologists—that from Muskham, in the Valley of the Trent. Professors Busk and Huxley, who have examined it, have considered that the skulls from Borris, Blackwater, Sennen, Anglesea, and some places in Scotland, belong to the same type.

Such being the case, we have then distinct evidence of an ancient race of men in this country, of whom we have no historic account. This Muskham skull was found in the month of June, 1861; and, by the kindness of Mr. Drake of Leicester, was a short time after its discovery placed in my hands.

The course of the river was diverted for the Great Northern Railway works, and, in digging for the foundation of a bridge over the new channel, this skull was found at a depth of twenty-five feet, associated with bones of *Bos primigenius*, *Bos longifrons*, *Cervus megaceros*, *Cervus elephus*, *Capra hircus*, *Equus caballus*.

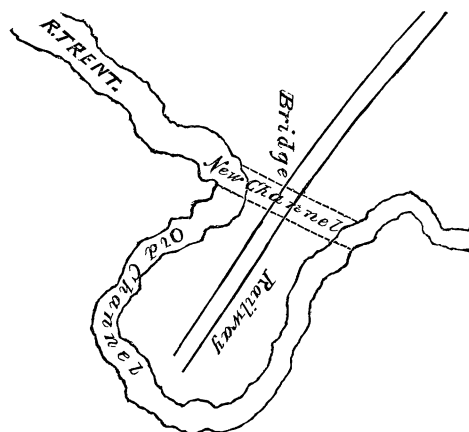


Fig. 1. PLAN OF THE DISTRICT OF MUSKHAM, NEAR NEWARK.

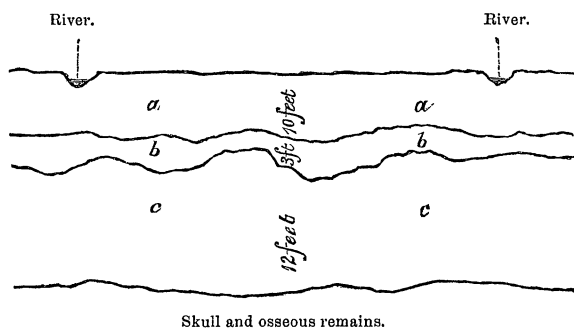


Fig. 2. SECTION OF DEPOSIT, SHOWING THE POSITION AND DEPTH OF SKULL AT MUSKHAM.

a, Loam. b, Clay. c, Pulpy silt, very soft, and gravel.

The stratified deposits above that in which the skull was found, had never been disturbed, but remained completely in their natural state. The excavations were on the estate of Mr. Chowler, of corn-law notoriety, who has kindly furnished every information and facility for a proper record of the circumstances.

These circumstances, then, will tend to rank the Trent Valley skulls with the "river-bed" race of Professor Busk, unless the peculiar character which I shall now point out should cause it to be regarded as of a more degraded, or properly more simioid type—a point we do not wish to insist upon from an isolated specimen. The value of this peculiar character depends on the value of what is known to anatomists and craniologists as the "Daubenton's line". If the plane of the *foramen magnum* is indicative, as it seems to me it ought to be, of the axial direction of the vertebral column, it would indicate (as shewn in the annexed drawing, Fig. 3)

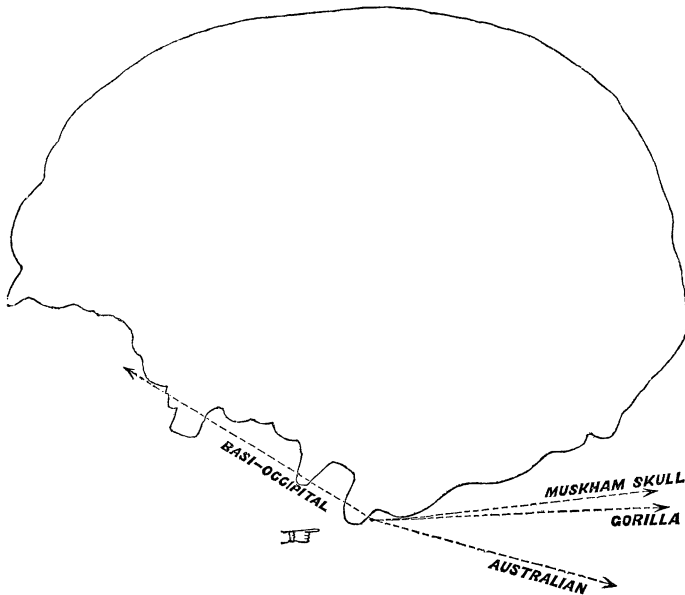


Fig. 3. SECTION OF MUSHKAM SKULL,  
Showing the directions of the plane of the Foramen Magnum in respect to the Basi-occipital line in it, the Gorilla and Australian Skulls.

a nearer approach in the Trent skull than is exhibited by any of the lowest existing races of men towards the ape type of structure. This step is, however, one *very far* removed from the actual gorilla or chimpanzee type; and Professor Busk, I believe, differs from me in opinion as to the value of this character, which, if the inference I draw be correct, is that the head was not truly set vertically and exactly balanced, but was set somewhat forward in respect to the cervical vertebra, and somewhat pulled back by the muscles of the neck—in fact, in a slight degree displaying the

character we see so strongly developed in the gorilla. In Professor Busk's plan of measurement, it appears to me that the value of the "Daubenton's line" could not be made apparent by reason that Professor Busk's plan must necessarily show a vertical line at right angles to a particular base line in every skull, and cannot, therefore, indicate or show the relationship of the setting of the vertebra in respect to the skull, because the vertical line will in his measurement be always at right angles to the selected base line of the skull, and not parallel with the axial line of the cervical vertebræ. Both Professor Huxley and Mr. Carter Blake have, independently of each other, noticed this peculiarity in their descriptions, which I here subjoin.

Professor Huxley says: "The skull has a very peculiar form. . . . The base of this skull is remarkable in several respects. The occipital foramen is placed far back, and its plane is directed more backwards than is usual in human skulls. Making the glabello-occipital line horizontal, and its length being 6·7 inches, the anterior edge of the occipital foramen lies 1·5 inch above the line, and a perpendicular let fall from it would cut the line 3·9 inches from its anterior end. A similar line let fall from the posterior edge would cut the glabello-occipital line at 5·3 inches from its anterior end, and that edge is only 0·9 of an inch above it in a length of 1·4. The plane of the occipital foramen, therefore, has a fall of 0·6 towards the glabello-occipital line.

"In a well formed European skull, whose glabello-occipital line measures 0·7 inches, while its extreme length is 7·25, the distance of the anterior edge of the occipital foramen from the glabella, measured in the same way along the glabello-occipital line, is 3·8; of its posterior edge 5·3. The anterior edge is 1·1 vertically above the line, and the posterior edge 1·0 above it.

"Thus, in a length of 1·5, the occipital foramen has a slope of only 0·1 inch, so that, instead of being greatly inclined backwards, it is nearly horizontal. . . .

"The skull thus described belongs to a cranial type which seems at one time to have been widely distributed over the British Islands. I have seen skulls from rude stone tombs in Holland with similar characters. There are skulls in the Museum of the Royal College of Surgeons exhibiting a similar character, from the remarkable tumulus at Towyn-y-Capel, Anglesea, described by the Hon. W. O. Stanley, M.P., in the *Archæological Journal* (Institute) for 1846, and my friend Mr. Busk has shewn me others from Cornwall. But the skulls which most clearly resemble the Muskham cranium are some, also from river-beds, which I saw in the Museum of the Royal Irish Academy, and in the collection at Trinity College, Dublin, and of which my friend Dr. E. P. Wright, the curator of that collection, has been good

enough to supply me with excellent casts. Two of these skulls are from the bed of the Nore, in Queen's County, and two from that of the Blackwater river, in Armagh, and one of the latter has the most extraordinary resemblance to the Muskham skull, as the following table of measurements will show :—

	Muskham. Blackwater.	
Maximum length .....	7·0	7·2
Length of glabello-occipital line.....	6·7	7·0
Greatest vertical height from centre of auditory foramen, the glabello-occipital line being horizontal .....	4·8	4·7
Distance of auditory foramen below glabello-occipital line .....	0·8	0·7
Greatest transverse diameter .....	5·4	5·65
Transverse diameter at the lower edge of the coronal suture .....	4·4	4·75
Horizontal circumference.....	20·5	20·75
Transverse arc from one auditory foramen to the other...	13·25	13·0
Antero-posterior arc from glabella to occipital pro- tuberance .....	12·5	12·5
Antero-posterior arc from glabella to posterior edge of the occipital foramen .....	14·25	14·4

“The plane of the occipital foramen of the Blackwater skull, however, is less inclined, so that this feature may be accidental in the Muskham skull. The frontal sinuses are also less developed in the Blackwater skull, but in all other respects the resemblance is very close. The other Blackwater skull and one of the Nore skulls are also very like the Muskham skull, but the remaining Irish skull from the Nore is much larger (having a length of 7·8 inches) and more depressed. It exhibits in a very marked manner, however, the projection of the anterior part of the occipital bone beyond the occipital protuberance which characterizes the other skulls, and it retains a strong resemblance to them in its other characters.”

Professor Huxley does not see any good ground for assigning to it a date earlier than the historic or immediately prehistoric epoch.

Mr. Carter Blake says—“One of the most important differences which the cranium of the *Troglodytes gorilla* presents to the human skull, has been defined by Professor Owen (Osteological Catalogue of the College of Surgeons) to be the more backward position of the *foramen magnum*, and its more oblique plane in relation to the base of the skull in the gorilla than in man. The almost horizontal direction of the *foramen magnum* in the human species, correlated with the character (*situs erectus*) applied by the Linnæan definition to man, is modified in the Valley of the Trent skull; and such modification is in the direction of the inferior type. The angle made by a line drawn from the anterior to the posterior margin of the *foramen magnum*, with the plane of the basi-occipital, is more oblique than I have

observed in any human skull, and markedly more so than in the so-called "lowest" races of mankind, as, *e. g.*, the Australians and Andaman islanders. This character, coupled with the powerful occipital spine, the ridged and crested surface of the lower half of the superoccipital, indicative of the action of powerful nuchal ligaments to keep the head from falling forwards, the presence of a paroccipital process for the firmer attachment of the *rectus capitis lateralis* and the slightly more backward position of the occipital condyles, seem to indicate an entirely erect position was not the normal attitude of the pre-historical contemporary of the *Bos primigenius* in the Valley of the Trent."

Since the publication of the above remarks, Mr. Blake has written to me to say that, to correct any misapprehension, he wishes it to be distinctly understood that he does not infer *simpliciter* that "the pre-historical contemporary of the *Bos primigenius* in the Valley of the Trent" was not erect, but merely that the morphological and teleological arguments afforded by the structure of the occipital segment in that individual were compatible with the theory that a stooping or semiprone attitude was habitually assumed by him. No conclusions are drawn by Mr. Blake from this single instance as to any race-characters.

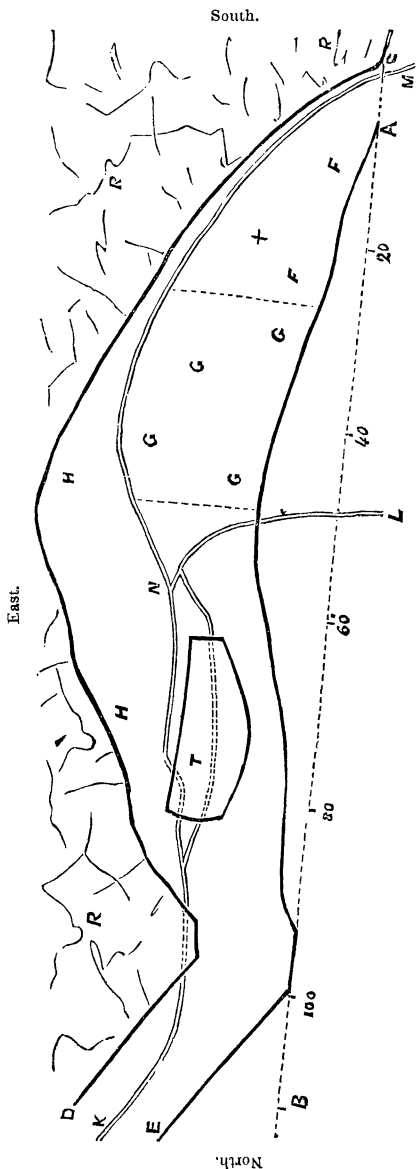
I have been endeavouring, but as yet without success, to procure the atlas, axis, and other cervical vertebræ of this specimen, the better, if possible, to elucidate this point; and especially I should wish to inquire of ethnologists if this peculiar character is known in any existing race, or even in any occasional individuals. I am not aware of any; and, as far as I am capable of judging of the skull before the Society, it appears to me to belong to an entirely extinct race.

The other relics to which this paper refers are those from a cave in the carboniferous limestone at Heathery Burn, near Stanhope, in Durham. The height of the cave is 800 feet above sea-level, and it is situated upwards of thirty miles inland from the coast. It was broken into in quarrying the limestone, which is used as a flux in the great ironworks of the Weardale Company; and it is to Mr. Elliott of West Croft, and to Mr. Cordner of Stanhope, the contractor of the works, that I am particularly indebted for the collections now placed on the table. To the former gentleman my best thanks are due for his care and intelligence in carrying out the minute instructions I sent him on the first information I received, in December last, of osseous remains being found in the cave; and to the latter gentleman, for the assistance he gave, and his generous supply of workmen for excavating that part of the cave which has proved so profitable to science, but which in a commercial point was profitless to himself. The relics found by W. H. Ware, Esq., of Stanhope, have also been kindly



placed by him in my hands, so that I am enabled to exhibit before this Society every valuable object, and a complete selection of illustrations of the conditions under which they were found, and

Fig. 4. GROUND PLAN OF HEATHERY BURN CAVE.



Scale 10 feet to the inch.

References.

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| <p>A B. Base line outside the cave.</p> <p>A C. Width of cave where water issued.</p> <p>A E and C D. Sides of the cave.</p> <p>F. Where human bones, tusks, bone knives, bone pins, pottery, and portion of armlet were found. No sand or pebbles, but large quantities of charcoal found here.</p> | <p>G. Bones, bone pins, tusks, pottery, etc., in coarse sand and smooth pebbles, with large quantities of charcoal.</p> <p>H. Bones, bronze spear-head, bronze pins, in sand and pebbles, with quantities of charcoal.</p> <p>J. Seven bronze celts, tusk, and bronze armlet, in sand with charcoal.</p> <p>K L. Present watercourse.</p> <p>M N. Ancient watercourse.</p> |
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of the animal-bones associated with the human relics and manufactured articles.

The accompanying plan and section were made, at my request, by Mr. Elliott, upon whom I impressed the value of doing this, and of marking upon them the exact position of every object found.

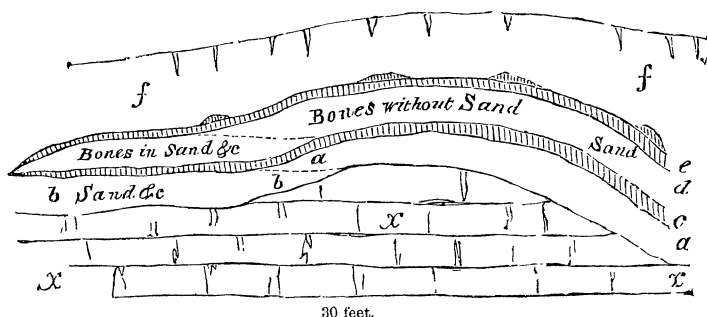


Fig. 5. LONGITUDINAL SECTION OF HEATHERLY BURN CAVE (at F in Ground Plan).

	ft. in.
f. Open cave . . . .	5 6
e. Stalagmite . . . .	0 4
d. Bone bed . . . .	1 2
c. Stalagmite . . . .	0 3
a. Angular blocks . . . .	2 9
x. Rock, limestone.	10 0

It will be seen from the section that the objects and bones were obtained from under four to eight inches of stalagmite, of the solidity and character of which the specimen exhibited, containing imbedded the fine tusk of a boar, furnishes a fair example.

At some places the floor of the cave was covered with innumerable small bones of fish and frogs. There were also limpet and mussel-shells strewed about, one oyster, and large quantities of fragments of charcoal. These, and some slightly-burnt bones, and numerous fractured hollow bones, broken seemingly for the sake of the marrow they contained, go to prove the cave was inhabited by the human beings whose remains have been found in it—an opinion which appears to be confirmed by the fact that a fragment of the waste-casting of one of the bronze articles has also been found in the cavern.\* There is much doubtfulness, however, in all cave accumulations, notwithstanding every pains and care which may be taken in the collecting. In a river-bed, or on a sea-shore or sea-bottom, where usually stratified deposits are formed, we know that a certain quantity of earthy material is incessantly being brought down, and covers in regular succes-

\* The half of a bronze celt-mould has since been obtained.

sion every carcase or article as it falls on the surface. Each is thus covered up in its turn ; and the mere fact of superposition is quite sufficient to establish the relative antiquities of the various objects embedded. Not so in a cave. Here, excluded from such constant and regular aqueous causes, and from atmospheric influences, the accumulated objects of 6,000 years may lie in close contact and juxta-position. Bones withered dry and sapless may be mixed together by the tread of the wolf or badger, or be turned over and mingled by rats. The harmless hare or the rabbit may commingle them, until at last they may be sealed down by the quietly evaporating waters which have percolated through the cavern-roof with a dense crust of stalagmite. Even this stalagmite may not form over all the floor of the cavern at once, nor continuously. One inch may be formed in this century, and then five hundred years may pass away before the next layer is made, and leave no trace of the silent passage of so much time. One of the skulls, of which the frontal portion only is preserved, resembles very closely the Trent Valley skull ; but another skull, of which a drawing is annexed, appears to me to

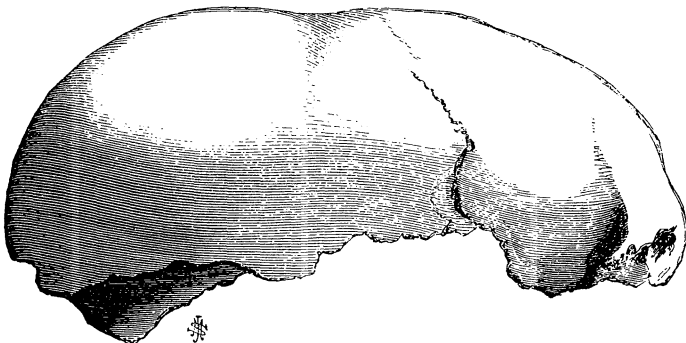


Fig. 6. PORTION OF SKULL FROM HEATHERY BURN CAVE.

belong more to the saddle-shaped type, and I should very gladly learn the opinion of craniologists respecting this point.

The relics themselves are interesting, belonging as they are supposed to do to the latter part of what has been termed by antiquaries "the Bronze Age." We know that the termination of this era has been placed in this country at a century or two B.C., and that therefore these relics must have a minimum antiquity of 2,000 years. It is a point, then, of very great interest to determine the actual contemporaneity of the human remains and the bronze and bone relics.

The care taken in collecting them leaves no doubt whatever of their association ; and so far we have, until proof is brought to

the contrary, the right to consider we have in these specimens the remains of the men who made these relics of the Bronze age. But it will be seen I have endeavoured to avoid drawing any than thoroughly tenable conclusions by the questions I have myself raised in respect to cave-deposits. If craniologists and ethnologists determine the presence of two races in this cave,—and we know two races have been found in the Etruscan caverns,—then the question will have to be discussed as to whether those two races existed at the same time in the cave, or were occupants at different periods.

As the case at present stands, we seem to have evidence of a (British) prehistoric race associated with articles of their daily use and manufacture.

These articles are, 1, of bone, viz., bone pins, bone scalpel (?), spindle-wheel; 2, of jet, portion of armlet; 3, of bronze, viz., knife, armlet, seven celts, and a fragment or surplus of a bronze casting. Besides these, fragments of charcoal, bones split for the marrow, cockle, oyster, and mussel-shells, were found; and the circumstances and position of the entombment of all these relics are carefully noted on the accompanying diagram and section. Some coarse pottery was also found in the cave, and is exhibited. It has been compared with some fragments of pottery of the Bronze age from the Swiss lakes, with which it seems identical in composition.

One observation in conclusion I may venture to make. In respect to the Trent skull, its slight tendency to an ape-like character would seem to point, upon the development hypothesis, to an African or tropical origin for the race to which it belonged—if race-type can be truly indicated by this isolated example; while all the successive waves of known European races have been, if I mistake not, from the colder or temperate regions towards the warmer areas of our globe. Is it possible, in the primitive periods of mankind, there were migrations towards colder countries, and that subsequently there have been rebounds in the opposite directions? Such ideas must be at present speculative in the extreme; but it will be as well to search narrowly for evidences of migrations as well as developments in respect to all primitive or prehistoric races.

Mr. CARTER BLAKE congratulated the Society on the assemblage of valuably collected and systematized facts which Mr. Mackie had brought forward, and called especial attention to the abnormal form of the *foramen magnum* in the Muskham skull. He declined to draw any conclusion as to race-character from a single instance, but thought that so far as the morphological and teleological arguments afforded by a comparison with the inferior animals, and the known function of the powerful muscles which must have drawn the head backwards in the Muskham skull, could entitle us to deduce any inference of probable function from known form, we might

conclude legitimately that the possessor of the Muskham skull was not so erect as the existing races of Europe. Similar skulls to the Muskham, differing from it however in the position of the occipital foramen, had been found at Sennen, Borris, Blackwater, Towyn-y-Capel, and possibly in the Valley of the Thames and in the Heathery Burn Cave. Some of these skulls had been ably described by Professor Huxley in the *Geologist*, vol. v, p. 200. Turning to the Heathery Burn remains, Mr. Blake said that he thought in these cases a rough approximation to the probable date might be formed by the estimation of the proportions of extinct and recent species of mammalia. They were as follows in some of the best authenticated instances of the association of human remains with those of extinct animals:—

*Chipped Flints.	Engis.	St. Amand.*	St. Roch.*	Grenelle.*	Gray's Inn Lane.*	Abbeville.*	Massat.	Brixham.*	Hoxne.*	Wookey Hole.*	Kent's Hole.*	Aurignac.	Muskham.	Switzerland.	Kjokken-møddings.	Heathery Burn.	Plau.
No. of extinct mammals....	5	5	7	4	1	8	7	5	3	10	12	7	2	4	2	—	—
No. of recent mammals....	—	—	—	—	—	1	1	1	1	4	19	12	5	27	14	7	3
Total.....	5	5	7	4	1	9	8	6	4	14	31	19	7	31	16	7	3

Mr. Blake considered that the human beings who chipped the flints of the Somme valley flourished at a period of time far antecedent to those of Muskham and Heathery Burn Cave; and the fact that we had no actual knowledge of their osseous remains shewed the futility of mere negative evidence in geology.

In reply to Mr. Prideaux, Mr. Blake stated that, though exceptional cases occurred in which the occipital protuberance was as well developed as in the Muskham skull, such instances were not accompanied by so powerful a development of the occipital crest, or of the points of attachment for the *trapezius*, *complexus*, *obliquus superior*, and *recti capiti posteriori* muscles.

In reply to Dr. Hunt, Mr. Blake said that in the *Quarterly Journal* of the Geological Society for 1861 had been figured the molar teeth of man, and that no anthropoid ape had been yet discovered in the pleistocene to which such remains could have been referred. The dental distinctions between man and the apes were obvious, and of easy determination.

Mr. JOHN EVANS, F.S.A., agreed with Mr. Mackie in respect to the age to which he had assigned the relics found in the Heathery Burn Cave. The pottery, also, was like that met with in tumuli of the Bronze Age.

Mr. T. WRIGHT gave it as his opinion that the objects exhibited were all distinctly of the Roman period, and even apparently late Roman. All the manufactured articles found in these caves, including Kent's Cavern, that he had seen, were at the earliest of the Roman period, and some rather more recent.

Mr. POOLE expressed the same opinion as Mr. Wright.

Dr. ROBERT KNOX said that great interest attached to the Muskham skull, and he agreed with the remarks made by Mr. Mackie on its anatomical characters. He did not object either to the inference Mr. Mackie had suggested in respect to the peculiar angle of the *foramen magnum*. Such a conformation, if proved to be a race-character, would certainly go towards filling up a known blank in the animal series; but we ought to wait until it was backed up by a hundred or two of specimens before it should be acknowledged as a race-character. But the author of the paper was not, he

considered, exceeding his duty as a scientific man in hazarding an opinion as to the tendency of so singular a feature from even a single example. If Mr. Mackie could have obtained the cervical vertebræ of the Muskhman man, they would have afforded, in all probability, very decided evidence on the point by their corresponding more or less strong processes.

Mr. LUKE BURKE said that those who spend so much time on anatomical details appear to forget what has been going on in other directions. If affinities could be traced between man and the gorilla he had no objection. Botanists might shew a development in a series of cabbages; so might naturalists in gorillas. But what was the evidence? He did not believe the anatomist could settle the point at all. Common sense was preferable to anatomical skill exerted on the skull and brain. We must look at the essential intellectual or mental differences as exerted in the daily habits and elevated conditions of man, and then we should give man his just rank by far higher and more important differences than by minute and obscure, perhaps only fanciful, anatomical details.

XXVI.—*An Account of the Wild Tribes of the Veddahs of Ceylon: their Habits, Customs, and Superstitions.* By JOHN BAILEY, B.A., Oxon., Principal Assistant Colonial Secretary of Ceylon.

“WEE shall, in this part, speak of the inhabitants of this Country, with their Religion, and Customs, and other things belonging to them. Of these Natives there be too Sorts—Wild and Tame. I will begin with the former. For, as in these Woods, there are Wild Beasts, so Wild Men also.”\*

So wrote, nearly two hundred years ago, that truthful old chronicler Robert Knox; and, though he praises God he never saw one of these “wild men,” he proceeds, nevertheless, to give us in a couple of pages, by far the best sketch of the Veddahs that has yet appeared, notwithstanding the multitude of pens that have been employed since his time, on Ceylon.

Early in 1854, I was appointed to the charge of the extensive district of Badulla, which comprises, besides the ancient Kandyan province of Ouvah, that portion of the island where the most barbarous Veddah tribes are found. My tastes led me to take every opportunity of studying their habits and customs. My official position gave me the greatest possible facilities for prosecuting my inquiries.

I accumulated much information that was both curious and valuable, but my official duties prevented me from shaping my rough notes into a readable form. For years, my papers lay in my desk, half forgotten, and it is only now that a little unlooked

\* An Historical Relation of the Island Ceylon, in the East Indies, etc., by Robert Knox, a Captive there near twenty years, folio, London, 1681.